

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :
SUGIURA ET AL. : EXAMINER: J. L. DOTE
SERIAL NO.: 10/618,640 :
FILED: JULY 15, 2003 : GROUP ART UNIT: 1756

FOR: EXTERNAL ADDITIVE FOR TONER FOR
ELECTROPHOTOGRAPHY, TONER FOR ELECTROPHOTOGRAPHY,
DOUBLE-COMPONENT DEVELOPER FOR ELECTROPHOTOGRAPHY,
IMAGE-FORMING PROCESS USING THE TONER, AND
IMAGE-FORMING APPARATUS USING THE TONER

DECLARATION UNDER 37 CFR 1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Now comes **Hideki Sugiura** who deposes and states:

1. That I am a graduate of Shizuoka University, and received Master degree in Science in the year of 1992.
2. That I have been employed by Ricoh Company Limited for 14 years as a researcher of Analytical Chemistry, i.e., functional materials (1992-1999) and of Developer, i.e., a toner (1999 to the present).
3. That I am a co-inventor in the above-identified application.
4. That I have read and understood Bader et al. (US 4,983,369) and Konya et al. (US 2003/0044706), which have been cited against the claims in the above-identified application.
5. That oxide fine particles disclosed in Konya et al. do not satisfy a relation of: $R/4 \leq \sigma \leq R$, which is one of the requirements of the present invention.
6. That the following additional calculation were conducted

under my supervision on April 23, 2007.

Calculation:

A standard deviation σ was calculated from the oxide fine particles shown in Fig. 1 of Barder et al. in the following manner.

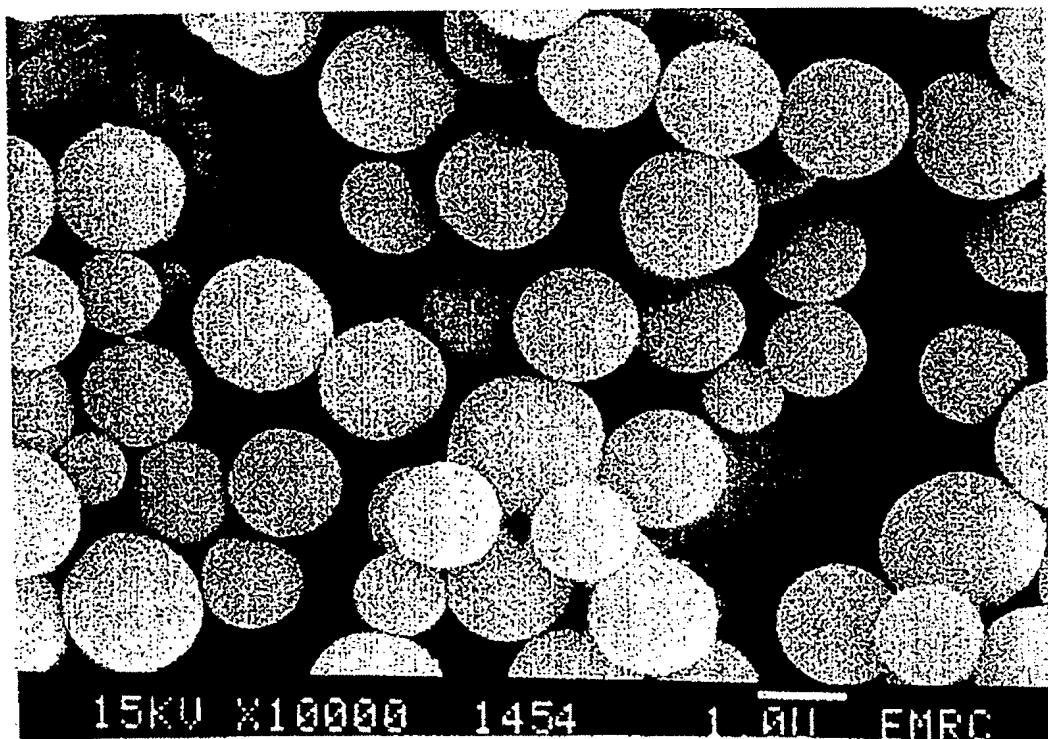
The image of Fig. 1 was scanned by a scanner (a product name: **Imagio MP C4500**, a manufacturer: Ricoh Company Limited), and was converted to a format of a bmp file. Thereafter, the images of oxide fine particles, i.e. silica particles, were selected by means of an image processing software (a product name: **Photoshop 6.0**, a manufacturer: **Adobe Systems Incorporated**). The selected images were analyzed by using **Image-Pro Plus 4.5.1J** manufactured by **Media Cybernetics, Inc.**, and a perimeter of each oxide fine particle was obtained. Based on the obtained perimeters, a number average primary particle diameter of the oxide fine particles in Fig. 1 was calculated, and was found to be 1.31 μm .

Sequentially, a standard deviation σ was calculated from the thus obtained average primary particle diameter by the following formula:

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \bar{x})^2}$$

Note that, in the formula, N denotes a number of images of the oxide fine particles used for the calculation, x denotes a primary particle diameter of each oxide fine particle, and \bar{x} denotes the average primary particle diameter, i.e. 1.31 μm .

FIGURE 1 Comparative Example, Single-Phase Reaction.



As a result of the calculation, it was found that the standard deviation σ of the oxide fine particles shown in Fig. 1 was $0.17 \mu\text{m}$.

Conclusion of Calculation:

From the calculations above, it was found that the oxide fine particles shown in Fig. 1 of Barder et al. had a primary particle diameter of $1.31 \mu\text{m}$ in number average, and a standard deviation σ of $0.17 \mu\text{m}$.

Discussion:

A number average particle diameter of Example 6 in Konya et al. will be discussed. Konya et al. discloses the particle size distribution of 40-180 nm in Example 6. A number average particle diameter and standard deviation cannot be exactly found from the range of particle size distribution. However, it will be approximated as follows:

We analyzed that the microspheres shown in Fig. 1 (Example 1) of Barder et al. had a number average particle diameter of 1.31 μm , and a standard deviation σ of 0.17 μm . On the other hand, Barder et al. discloses that microspheres shown in Fig. 1 had a particle diameter of 0.5 to 1.5 μm (see lines 7-8 in Column 7). That is, a number average particle diameter and a standard deviation σ of a sample having a particle size distribution of 0.5 to 1.5 μm are respectively calculated and found to be 1.31 μm and 0.17 μm .

Konya et al. discloses the particle size distribution of 40-180 nm (0.04-0.18 μm). The particle size distribution of Barder et al. is relatively similar to that of Konya et al. The particle size of Konya et al. is approximately 1/10 times that of Barder et al. Therefore, a number average particle diameter and standard deviation of Konya et al. respectively found by the following equations: $1.31 \times 1/10 = 0.131\mu\text{m}$ (131 nm); and $0.17 \times 1/10 = 0.017\mu\text{m}$ (17 nm). The number average particle diameter 131nm multiplied by 1/4 equals 32.5 nm. Although it is approximate, at least about 2 times 17 nm. Therefore, a particle diameter R and a standard deviation σ of Konya et al. do not satisfy the relation of $R/4 \leq \sigma \leq R$, but $R/4 = 32.5\text{ nm} > 17\text{ nm} (\sigma)$. Therefore, Example 6 of Konya et al. does not fall within the claimed range of the present application.

Conclusion:

The oxide fine particles disclosed in Example 6 of Konya et al. do not satisfy a relation of: $R/4 \leq \sigma \leq R$, which is one of the requirements of the present invention.

7. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

8. Further deponent saith not.

Hideki Sugiura
Hideki Sugiura

December 26, 2007
Date